IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of: **Hiroshi YOSHIDA**

Group Art Unit: **Not yet assigned**

Serial No.: **10/518,391**

Examiner: **Not yet assigned**

Filed: **December 17, 2004**

Confirmation No.: **Not yet assigned**

For: **MAGNETORESISTIVE RANDOM-ACCESS MEMORY DEVICE**

Attorney Docket Number: **043025**
Customer Number: **38834**

SUBMISSION OF ENGLISH TRANSLATION OF IPER

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

July 15, 2005

Sir:

Submitted herewith is an English translation of the International Preliminary Examination Report for the above-identified U.S. patent application. Please note that the cited references of the International Preliminary Examination Report were previously filed with the Information Disclosure Statement on December 17, 2004.

If any additional fees are due in connection with this submission, please charge our Deposit Account No. 50-2866.

Respectfully submitted,

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SK/sg
Enclosure: Form PCT/IB/338

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF TRANSMITTAL
OF COPIES OF TRANSLATION
OF THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT
(PCT Rule 72.2)

To:

NISHI, Yoshiyuki
Nishi Patent Office
Suite 211, 26-32, Nakahara 4-chome
Isogo-ku
Yokohama-shi, Kanagawa 235-0036
JAPON

Date of mailing *(day/month/year)* 09 December 2004 (09.12.2004)	
Applicant's or agent's file reference YG2003-15PCT	**IMPORTANT NOTIFICATION**
International application No. PCT/JP2003/007447	International filing date *(day/month/year)* 11 June 2003 (11.06.2003)
Applicant JAPAN SCIENCE AND TECHNOLOGY AGENCY et al	

1. **Transmittal of the translation to the applicant.**

The International Bureau transmits herewith a copy of the English translation made by the International Bureau of the international preliminary examination report established by the International Preliminary Examining Authority.

2. **Transmittal of the copy of the translation to the elected Offices.**

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following elected Offices requiring such translation:

CN, EP, KR

The following elected Offices, having waived the requirement for such a transmittal at this time, will receive copies of that translation from the International Bureau only upon their request:

US

3. **Reminder regarding translation into (one of) the official language(s) of the elected Office(s).**

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report.

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Yoshiko Kuwahara
Facsimile No.+41 22 740 14 35	Facsimile No.+41 22 338 90 90

Translation

PATENT COOPERATION TREATY

PCT/JP2003/007447

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference YG2003-15PCT	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/JP2003/007447	International filing date (*day/month/year*) 11 June 2003 (11.06.2003)	Priority date (*day/month/year*) 18 June 2002 (18.06.2002)
International Patent Classification (IPC) or national classification and IPC H01L 27/105, 43/08, 43/12, G11C 11/15		
Applicant JAPAN SCIENCE AND TECHNOLOGY AGENCY		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
26 December 2003 (26.12.2003)	16 June 2004 (16.06.2004)
Name and mailing address of the IPEA/JP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/JP2003/007447

I. Basis of the report

1. With regard to the **elements** of the international application:*

☐ the international application as originally filed

☒ the description:

pages 1-22, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☒ the claims:

pages 2-11, as originally filed

pages _____, as amended (together with any statement under Article 19

pages 12,13, filed with the demand

pages _____, filed with the letter of _____

☒ the drawings:

pages 1/4-4/4, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☒ the claims, Nos. 1

☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	2-13	YES
	Claims		NO
Inventive step (IS)	Claims	2-13	YES
	Claims		NO
Industrial applicability (IA)	Claims	2-13	YES
	Claims		NO

2. Citations and explanations

List of Documents Cited

1. JP, 2000-196030, A (YAMAHA CORPORATION), 14 July 2000 (14.07.00), full text (Family: none)
2. US, 2002/0057594, A1 (TADAHIKO HIRAI), 16 May 2002 (16.05.02), full text & JP, 2002-141481, A & JP, 2002-140889, A & JP, 2002-170375, A
3. Magnetotransport properties of a room temperature rectifying tunnel junction made of electron and hole doped manganites (C. MITRA, ET AL.), Journal of Applied Physics, 15 May 2002 (15.05.02), Vol. 91, No. 10, pages 7715-7717

Claims 2-13

None of the documents cited in the ISR including documents 1-3 listed above describes a magnetoresistive random-access memory device that provides a TMR element with a switch effect utilizing the rectification effect due to the p-n low-resistance tunneling magnetoresistance effect due to the junction between a p-type halfmetallic ferromagnetic semiconductor and an n-type halfmetallic ferromagnetic semiconductor; a magnetoresistive random-access memory device that provides a TMR element with a switch effect utilizing the rectification effect through a p-i-n low-resistance tunneling magnetoresistive (low-resistance TMR) diode in which the p-type halfmetallic ferromagnetic semiconductor consists of a group II-VI compound semiconductor doped with Cr and holes, the n-type halfmetallic ferromagnetic semiconductor consists of the aforesaid group II-VI compound semiconductor doped with V and electrons, and at least one layer of a nonmagnetic insulator atom layer (i layer) is sandwiched therebetween; a magnetoresistive random-access memory device that provides a TMR element with a switch effect utilizing the rectification effect through a p-i-n low-resistance tunneling magnetoresistive (low-resistance TMR) diode in which the p-type halfmetallic ferromagnetic semiconductor consists of a group III-V compound semiconductor doped with Mn and holes, the n-type halfmetallic ferromagnetic semiconductor consists of the aforesaid group III-V compound semiconductor doped with Cr and electrons, and at least one layer of a nonmagnetic insulator atom layer (i layer) is sandwiched therebetween; a magnetoresistive random-access memory device that provides a TMR element with a switch effect utilizing the rectification effect through a p-i-n low-resistance tunneling magnetoresistive (low-resistance TMR) diode in which the p-type halfmetallic ferromagnetic semiconductor consists of ZnO doped with Cr and holes, the n-type halfmetallic ferromagnetic semiconductor consists of ZnO doped with V, Fe, Co or Ni and electrons, and at least one layer of a nonmagnetic insulator atom layer (i layer) is sandwiched therebetween; or a magnetoresistive random-access memory device that provides a TMR element with a switch effect utilizing the rectification effect through a p-i-n low-resistance tunneling magnetoresistive (low-resistance TMR) diode in which the p-type halfmetallic ferromagnetic semiconductor consists of a group IV semiconductor doped with Fe and holes, the n-type halfmetallic ferromagnetic semiconductor consists of the aforesaid group IV semiconductor doped with Mn and electrons, and at least one layer of a nonmagnetic insulator atom layer (i layer) is sandwiched therebetween, and it is not obvious to a person skilled in the art.